

CLAIMS

WHAT IS CLAIMED IS:

1. A method of sending first data from a first device to a destination device, said first device being connected by a network to a plurality of second devices, said network having a first session topology which defines a first set of one or more of said second devices to which data may be directly addressed from said first device, said method comprising the acts of:

joining a session having a second session topology which defines a second set of one or more of said second devices to which data may be directly addressed from said first device, said destination device being a member of said second set;

creating a first data package which contains: (a) said first data; and (b) a header;

addressing said first data package to said destination device; sending said first data package to said destination device according to said first session topology.

2. The method of claim 1, wherein said device is communicatively coupled to a microphone, and wherein said method further comprises: capturing said first data using said microphone.

3. The method of claim 1, wherein said destination device is not a member of said second set, and wherein said sending act comprises: appending a header to said data package which indicates that said data package is to be delivered to said destination device; and sending said data package to a host device different from said destination device, said host device being a member of said first set.

4. The method of claim 3, wherein said destination device is a member of said first set.

5. The method of claim 3, further comprising the acts of:

5 in said host device, receiving a second data package from a
second device, said data package comprising: (a) second data; and (b) a header which
indicates that said data package is to be delivered to said destination device; and
 said host device sending to said destination device a mixed stream
comprising said first data and said second data.

6. The method of claim 3, further comprising the acts of:

 in said host device, receiving a second data package from a
second device, said data package comprising: (a) second data; and (b) a header which
indicates that said data package is to be delivered to said destination device; and
15 said host device sending said first and second data packages
separately to said destination device.

7. The method of claim 1, wherein said sending act comprises sending
said first data package using non-guaranteed delivery.

8. A computer-readable medium having computer-executable instructions
to perform the method of claim 1.

9. A method of hosting a communication session among a plurality of
25 nodes in a network, a first one of said plurality of nodes being designated as a host of
the communication session, the method comprising the acts of:

receiving, at a second one of said plurality of nodes different from the first one of said plurality of nodes, a notification of a departure of the first one of said plurality of nodes from the communication session;

determining, according to a pre-determined algorithm, that said
5 second one of said plurality of nodes is designated to replace the first one of said plurality of nodes as a host of the communication session; and

sending, from said second one of said plurality of nodes to at least a third one of said plurality of nodes different from said first and second ones of said plurality of nodes, an indication that said second one of said plurality of nodes has
10 become a host of the communication session.

10. The method of claim 9, wherein each of said plurality of nodes is associated with a corresponding numeric identifier, and wherein pre-determined algorithm is based on said numeric identifiers.

15 11. The method of claim 10, wherein said pre-determined algorithm comprises determining which of said nodes is associated with the lowest-valued identifier.

20 12. The method of claim 9, further comprising the acts of:
capturing audio data from an input device; and
sending said audio data from said second one of said plurality of nodes to said third one of said plurality of nodes.

25 13. The method of claim 9, further comprising the act of:
sending, from said second one of said plurality of nodes to said third one of said plurality of nodes, a name table indicative of nodes in the communication session.

14. The method of claim 9, further comprising the acts of:

receiving a message from a fourth one of said plurality of nodes;

and

5 forwarding said message to said third one of said plurality of nodes.

15. A computer-readable medium having computer-executable instructions to perform the method of claim 9.

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16. A method of participating in a communication session among a plurality of nodes in a network, each of the plurality of nodes being associated with a corresponding numeric identifier, a first one of said plurality of nodes being designated as the host of the communication session, said method comprising the acts of:

15 receiving a notification of a departure of the first one of said plurality of nodes from the communication session;

determining, according to a pre-determined algorithm based on the numeric identifiers, that a second one of said plurality of nodes is designated to replace the first one of said plurality of nodes as a host of the communication session;

20 and

receiving, from said second one of said plurality of nodes, an indication that said second one of said plurality of nodes has become a host of the communication session.

25 17. The method of claim 16, wherein said pre-determined algorithm comprises determining which of said nodes is associated with the lowest-valued identifier.

18. The method of claim 16, further comprising the acts of:
capturing audio data from an input device; and
sending said audio data to said second one of said plurality of
nodes.

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19. The method of claim 16, further comprising the act of:
receiving, from said second one of said plurality of nodes, a
name table indicative of nodes in the communication session.

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20. The method of claim 16, further comprising the act of:
sending a message to said second node with an instruction to
deliver said message to a third node different from said second node.

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21. A computer-readable medium having computer-executable
instructions to perform the method of claim 16.

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22. A system for communicating over a network comprising:
a communication port which transmits and receives information
over said network;
a processor;
a memory communicatively coupled to said processor, said
memory having a location in which a first identifier is storable, said memory storing at
least:

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a first program module which sends information to a first
node in said network through said communication port, and which receives information
from said first node through said communication port, said first node being a member
of a session;

a second program module which generates a second identifier based on a function; and

a third program module which adds a second node in said network to said session, said third program module being operative or non-operative
5 according to a comparison of said second identifier with said first identifier.

23. The system of claim 22, wherein said comparison comprises an equality comparison between said second identifier and said first identifier.

10 24. The system of claim 22, wherein each node in said session is associated with a host order value, said first identifier being a one of said host order values, wherein said memory further stores a table indicative of the respective host order values associated with each node in said session, and wherein said function is based on an ordering among said host order values.

15 25. The system of claim 24, wherein said function comprises identifying the lowest value among said host order values.

20 26. The system of claim 22, further comprising a microphone which generates audio data, wherein said first module transmits said audio data to said first node through said communication port.

27. The system of claim 22, wherein said memory further stores:
a fourth program module which determines that first data
25 received by said first program module is addressed to a third node and which relays said first data to said third node.

28. The system of claim 22, wherein said memory further stores:

a fourth module which maintains a name table of nodes in said session.

29. A method of communicating between a first process and a second
5 process, comprising the acts of:

issuing, by the first process, a connection call having a plurality
of call parameters comprising configuration information for a sound device, client
configuration information, and a flag;

receiving, by the second process, the connection call and parsing
10 the call to retrieve the parameters;

connecting said first process to a networking session based on
said plurality of call parameters; and

issuing, by the second process, an acknowledgment that said first
process is connected to said networking session.

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30. The method of claim 29, wherein said configuration information for
a sound device comprises a DVSOUNDDEVICECONFIG data structure or a pointer
thereto.

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31. The method of claim 29, wherein said client configuration
information comprises a DVCLIENTCONFIG data structure or a pointer thereto.

32. The method of claim 29, further comprising the act of receiving a
name table from a member of said first networking session.

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33. The method of claim 29, wherein said networking session comprises
a session for the transmission of audio data.

34. A computer-readable medium having computer-executable instructions to perform the method of claim 29.

35. A method of disconnecting a client from a networking session among
5 a plurality of nodes:

receiving a disconnection request message from said client;
sending an acknowledgment of said disconnection request
message to said client; and

10 sending a notification to at least some of said plurality of nodes
that said client has disconnected from the networking session.

36. The method of claim 35, wherein said notification comprises a
reason for the disconnection of said client.

15 37. The method of claim 35, wherein said notification comprises an
identifier of said client.

38. The method of claim 35, wherein said networking session comprises
a session for the transmission of audio data.

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39. A computer-readable medium having computer-executable
instructions to perform the method of claim 35.

40. A method of sending audio data over a network comprising the acts
25 of:

receiving, from said audio engine, a first send call having a
plurality of call parameters comprising a buffer of audio data and a first audio session
identifier of a destination of said audio data; and

sending said audio data to said destination.

41. The method of claim 40, further comprising the act of providing to said voice engine a second audio session identifier.

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42. The method of claim 40, wherein said audio data comprises a digital signal captured by said voice engine from an audio input device.

43. A computer-readable medium having computer-executable
10 instructions to perform the method of claim 40.

44. In a first software object which executes on a computing device and which facilitates the transmission of data from the computing device over a computer network, said first software object participating in a first session having a host, a
15 method of providing communication services to a second software object and of permitting said computing device to participate in a second session, said method comprising the acts of:

exposing a callable function which provides a plurality of data to a caller, said plurality of data including:

20 one or more flags;
a type of the first session;
a first identifier of the host;
a second identifier which identifies the computing device
in the second session; and
25 a number indicative of a number of nodes that may
participate in the first or second sessions; and
providing said plurality of data in response to a call to said
callable function.

45. The method of claim 44, wherein said callable function receives a parameter comprising a pointer to a structure, and wherein said providing act comprises:

5 writing said plurality of data to the structure referenced by said pointer.

46. A device which participates in (a) a first network session having a host, and (b) a second network session, said device comprising:

10 a processor;

a memory communicatively connected to said processor, said memory storing:

a first software object including instructions executable on said processor, said instructions including a callable function which provides a plurality of data including:

one or more flags;

a type of the first session;

a first identifier of the host;

a second identifier which identifies the device in

20 the second session; and

a number indicative of a number of nodes that may participate in the first or second sessions; and

a second software object executable on said processor which calls said callable function and which participates in the second network session based on said plurality of data.

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47. The system of claim 46, wherein said callable function receives a parameter comprising a pointer to a structure and provides said plurality of data by writing said plurality of data to the structure referenced by said pointer.

5 48. A method of providing communication between a plurality of nodes in a computer network, said method comprising the acts of:

 exposing, by a first software object, a set of functions callable by a second software object different from said first software object, each of said functions including a corresponding set of computer-executable instructions which are executable
10 by a computing device upon being called, said functions including:

 an initialize function;

 a notify_events function callable with parameters including an event type and one or more data; and

 a receive_speech_message function callable with
15 parameters including: (a) a message; (b) a size of said message; (c) a first identifier of a first one of the plurality of nodes from which said message is received; and (d) a second identifier indicative of a second one of the plurality of nodes to which said message is destined;

 receiving, from said second software object, a call to a first one
20 of said functions; and

 executing the set of computer-executable instructions which corresponds to said first one of said functions.

 49. The method of claim 48, wherein said first software object comprises
25 a COM object.

 50. A computer-readable medium having computer-executable instructions to perform the method of claim 48.

51. A method of providing communication between a first node and a plurality of second nodes in a computer network, said method comprising the acts of:

exposing, by a first software object, a set of functions callable by
5 a second software object different from said first software object, each of said functions including a corresponding set of computer-executable instructions which are executable by a computing device upon being called, said functions including:

an advise function callable with parameters including: (a) a callable interface; and (b) an object type indicative of whether the first node is a client
10 or a server;

an unadvise function callable with parameters including an object type indicative of whether the first node is a client or a server;

an is_group_member function callable with parameters including: (a) a group identifier; and (b) a node identifier;

15 a send_speech function callable with parameters including:
(a) a pointer to a structure which describes data; (b) a context; (c) one or more flags;
(d) an identifier indicative of a node to which said data is destined; and (e) an identifier indicative of a node from which said data originates;

a get_session_info function callable with parameters
20 including a pointer to a structure in which data descriptive of a session is to be written;

an is_valid_entity function callable with parameters including: (a) a node identifier; and (b) a pointer to a location into which a boolean value is to be written;

a send_speech_ex function callable with parameters
25 including: (a) a pointer to a structure which describes data; (b) an identifier of a node from which the data originates; (c) an array of one or more target destinations to which said data is to be sent; (d) a number indicative of the number of said one or more target destinations in said array; (e) a context; and (f) one or more flags;

an is_valid_group function callable with parameters including: (a) a group identifier; and (b) a pointer to a location into which a boolean value is to be written; and

an is_valid_player function callable with parameters including: (a) a node identifier; and (b) a pointer to a location into which a boolean value is to be written;

receiving, from said second software object, a call to a first one of said functions; and

executing the set of computer-executable instructions which corresponds to said first one of said functions.

52. The method of claim 51, wherein said first software object comprises a COM object.

53. A computer-readable medium having computer-executable instructions to perform the method of claim 51.